		Pushing the E	nvelope
		2006 Scie	
District of Columbia	Caianaa	Learning Star	ndards
Grade 5	Science		
Activity/Lesson	State	Standards	
Activity/Ecoson	Otate	Otaridards	
Types of Engines (pgs. 11-23)	DC	SCI.5.6.3	Unbalance forces cause changes in velocity. As a basis for understanding this concept, students: Investigate and describe that unbalanced forces cause changes in the speed and/or direction of motion of an object (acceleration).
Physics and Math (pgs. 43-63)	DC	SCI.5.6.2	Unbalance forces cause changes in velocity. As a basis for understanding this concept, students: Demonstrate that if the forces acting on an object are balanced so that the net force is zero, the object will remain at rest if it is initially at rest or will maintain a constant speed and direction if it is initially moving.
Physics and Math (pgs. 43-63)	DC	SCI.5.6.3	Unbalance forces cause changes in velocity. As a basis for understanding this concept, students: Investigate and describe that unbalanced forces cause changes in the speed and/or direction of motion of an object (acceleration).
Physics and Math			Unbalance forces cause changes in velocity. As a basis for understanding this concept, students: Investigate and describe that the greater the net force, F, applied to a body, the greater its acceleration, a. Describe that the greater the mass, m, of an object, the smaller the
(pgs. 43-63) Rocket Activity (pgs. 69-75)	DC DC	SCI.5.6.5 SCI.5.6.2	acceleration produced by a given force. Unbalance forces cause changes in velocity. As a basis for understanding this concept, students: Demonstrate that if the forces acting on an object are balanced so that the net force is zero, the object will remain at rest if it is initially at rest or will maintain a constant speed and direction if it is initially moving.
Rocket Activity (pgs. 69-75)	DC	SCI.5.6.3	Unbalance forces cause changes in velocity. As a basis for understanding this concept, students: Investigate and describe that unbalanced forces cause changes in the speed and/or direction of motion of an object (acceleration). Unbalance forces cause changes in velocity. As a basis for understanding this concept, students: Investigate and describe that the greater the net
Rocket Activity (pgs. 69-75)	DC	SCI.5.6.5	force, F, applied to a body, the greater its acceleration, a. Describe that the greater the mass, m, of an object, the smaller the acceleration produced by a given force.

		Pushing the E	nvelone	
2006 Science Learning Standards				
Grade 5 (New Grade				
Activity/Lesson	State	Standards		
- 1001110J/200011			Students will be introduced to concepts of forces	
			and motion. Students should be able to:	
			Describe that unbalanced forces cause changes	
Types of Engines (in the speed and/or direction of motion of an	
pgs. 11-23)	DC	SCI.5.9.3	object (acceleration).	
,			Students will be introduced to concepts of forces	
			and motion. Students should be able to:	
			Describe that, for an object moving in a straight	
			line, acceleration, a, is the change in velocity, v,	
Types of Engines (divided by the time, t, that change takes (a = v ÷	
pgs. 11-23)	DC	SCI.5.9.4	t).	
			Students will be introduced to concepts of heat	
			and energy: Students should be able to: Explain	
Chemistry (pgs. 25-			that many kinds of chemical changes occur	
41)	DC	SCI.5.8.2	faster at higher temperatures.	
			Students will be introduced to concepts of forces	
			and motion. Students should be able to:	
			Demonstrate that if the forces acting on an	
			object are balanced so that the net force is zero,	
			the object will remain at rest if it is initially at rest	
Physics and Math			or will maintain a constant speed and direction if	
(pgs. 43-63)	DC	SCI.5.9.2	it is initially moving.	
			Students will be introduced to concepts of forces	
			and motion. Students should be able to:	
			Describe that unbalanced forces cause changes	
Physics and Math	50	201500	in the speed and/or direction of motion of an	
(pgs. 43-63)	DC	SCI.5.9.3	object (acceleration).	
			Students will be introduced to concepts of forces	
			and motion. Students should be able to:	
			Describe that the greater the net force, F,	
			applied to a body, the greater its acceleration, a.	
Physics and Math			Describe that the greater the mass, m, of an	
•	DC	SCI.5.9.5	object, the smaller the acceleration produced by a given force.	
(pgs. 43-63)	DC	301.3.9.3	Students will be introduced to concepts of forces	
			and motion. Students should be able to:	
			Demonstrate that if the forces acting on an	
			object are balanced so that the net force is zero,	
			the object will remain at rest if it is initially at rest	
Rocket Activity (pgs.			or will maintain a constant speed and direction if	
69-75)	DC	SCI.5.9.2	it is initially moving.	
00 10)		001.0.0.2	Students will be introduced to concepts of forces	
			and motion. Students should be able to:	
			Describe that unbalanced forces cause changes	
Rocket Activity (pgs.			in the speed and/or direction of motion of an	
69-75)	DC	SCI.5.9.3	object (acceleration).	
00 10)	50	001.0.0.0	object (decoloration).	

			Students will be introduced to concepts of forces and motion. Students should be able to: Describe that the greater the net force, F, applied to a body, the greater its acceleration, a. Describe that the greater the mass, m, of an
Rocket Activity (pgs.			object, the smaller the acceleration produced by
69-75)	DC	SCI.5.9.5	a given force.
		Pushing the E	nvelope
		2006 Scie	
District of Columbia	Caianaa	Learning Star	ndards
Grade 8	Science		
Activity/Lesson	State	Standards	
/ total vitaly / 2000011	Otato	otania i do	All objects experience a buoyant force when immersed in a fluid. As a basis for understanding this concept, students: Demonstrate that the mass of an object is a measure of the quantity of matter it contains
Types of Engines (pgs. 11-23)	DC	SCI.8.4.1	(measured in kg or g), and that its weight (measured in N) is the magnitude of the gravitational force exerted between Earth and that much mass.
Types of Engines (pgs. 11-23)	DC	SCI.8.7.3	When an object is subject to two or more forces at once, the effective force is the cumulative effect of all the forces. As a basis for understanding this concept, students: Explain why an unbalanced force acting on an object changes the object's speed or direction of motion or both.
Types of Engines (pgs. 11-23)	DC	SCI.8.7.5	When an object is subject to two or more forces at once, the effective force is the cumulative effect of all the forces. As a basis for understanding this concept, students: Know that the greater the mass of an object, the more force is needed to change its motion.
Chemistry (pgs. 25-41)	DC	SCI.8.2.8	Elements have distinct macroscopic properties and atomic structures. As a basis for understanding this concept, students: Describe how the atoms, molecules, or ions comprising an object are in constant individual motion, and explain how their average motional (kinetic) energy determines the temperature of the object, and how the strength of the forces between them determines the state of matter at that temperature.

Chemistry (pgs. 25-41)	DC	SCI.8.3.3	Chemical reactions are processes in which atoms are rearranged into different combinations of molecules. As a basis for understanding this concept, students: Explain how the idea of atoms, as proposed by John Dalton, explains the conservation of matter: In chemical reactions, the number of atoms stays the same no matter how they are arranged, and the mass of atoms does not change significantly in chemical reactions, so their total mass stays the same.
			All objects experience a buoyant force when immersed in a fluid. As a basis for
Chemistry (pgs. 25-41)	DC	SCI.8.4.1	understanding this concept, students: Demonstrate that the mass of an object is a measure of the quantity of matter it contains (measured in kg or g), and that its weight (measured in N) is the magnitude of the gravitational force exerted between Earth and that much mass.
71)		ООПО. 4. 1	Scientific progress is made by asking questions
Physics and Math			and conducting careful investigations. As a basis for understanding this concept and to address the content in this grade, students should develop their own questions perform investigations. Students: Read analog and digital meters on instruments used to make direct measurements of length, volume, weight, elapsed time, rates, or temperatures, and choose appropriate units. Explain how to
(pgs. 43-63)	DC	SCI.8.1.8	interpolate on analog scales. When an object is subject to two or more forces
Physics and Math (pgs. 43-63)	DC	SCI.8.7.1	at once, the effective force is the cumulative effect of all the forces. As a basis for understanding this concept, students: Recognize that a force has both magnitude and direction.
Physics and Math			When an object is subject to two or more forces at once, the effective force is the cumulative effect of all the forces. As a basis for understanding this concept, students: Explain why an unbalanced force acting on an object changes the object's speed or direction of
(pgs. 43-63)	DC	SCI.8.7.3	motion or both.
Physics and Math (pgs. 43-63)	DC	SCI.8.7.5	When an object is subject to two or more forces at once, the effective force is the cumulative effect of all the forces. As a basis for understanding this concept, students: Know that the greater the mass of an object, the more force is needed to change its motion.

at once, the effective force is the cumulative effect of all the forces. As a basis for understanding this concept, students: Explain that if the net force acting on an object always acts toward the same center as the object moves, the object's path is a curve about the force center. (Motion in a circular orbit is the simplest example of this concept.) DC SCI.8.7.6 simplest example of this concept.) When an object is subject to two or more force at once, the effective force is the cumulative effect of all the forces. As a basis for understanding this concept, students: Recognize that a force has both magnitude at direction. When an object is subject to two or more force at once, the effective force is the cumulative effect of all the forces. As a basis for understanding this concept, students: Explain why an unbalanced force acting on an object changes the object's speed or direction of motion or both. Rocket Activity (pgs. BC SCI.8.7.3 motion or both. When an object is subject to two or more force at once, the effective force is the cumulative effect of all the forces. As a basis for understanding this concept, students: Know the greater the mass of an object, the more force at once, the effective force is the cumulative effect of all the forces. As a basis for understanding this concept, students: Know the greater the mass of an object, the more force at once, the effective force is the cumulative effect of all the forces. As a basis for understanding this concept, students: Know the greater the mass of an object, the more force is needed to change its motion. Pushing the Envelope 2006 Science Learning Standards District of Columbia Science Grade 8 Activity/Lesson State Standards Students at this level should be honing their skills in experimental design. Students should be able to: Read analog and digital meters on instruments used to make direct measurement instruments used to make direct measurement.				
69-75) DC SCI.8.7.1 When an object is subject to two or more forc at once, the effective force is the cumulative effect of all the forces. As a basis for understanding this concept, students: Explain why an unbalanced force acting on an object changes the object's speed or direction of motion or both. When an object is subject to two or more force at once, the effective force is the cumulative effect of all the forces. As a basis for understanding this concept, students: Know to the greater the mass of an object, the more force is needed to change its motion. Pushing the Envelope 2006 Science Learning Standards District of Columbia Science Grade 8 Activity/Lesson State Students at this level should be honing their skills in experimental design. Students should be able to: Read analog and digital meters on instruments used to make direct measurement.	(pgs. 43-63)	DC	SCI.8.7.6	effect of all the forces. As a basis for understanding this concept, students: Explain that if the net force acting on an object always acts toward the same center as the object moves, the object's path is a curve about the force center. (Motion in a circular orbit is the simplest example of this concept.) When an object is subject to two or more forces at once, the effective force is the cumulative effect of all the forces. As a basis for understanding this concept, students:
When an object is subject to two or more force at once, the effective force is the cumulative effect of all the forces. As a basis for understanding this concept, students: Explain why an unbalanced force acting on an object changes the object's speed or direction of motion or both. BC SCI.8.7.3 Men an object is subject to two or more force at once, the effective force is the cumulative effect of all the forces. As a basis for understanding this concept, students: Know the greater the mass of an object, the more force is needed to change its motion. BUSTINGTON BOC SCI.8.7.5 force is needed to change its motion. Pushing the Envelope 2006 Science Learning Standards District of Columbia Science Grade 8 Activity/Lesson State Standards Students at this level should be honing their skills in experimental design. Students should be able to: Read analog and digital meters on instruments used to make direct measuremer				
at once, the effective force is the cumulative effect of all the forces. As a basis for understanding this concept, students: Explain why an unbalanced force acting on an object changes the object's speed or direction of e9-75) DC SCI.8.7.3 When an object is subject to two or more force at once, the effective force is the cumulative effect of all the forces. As a basis for understanding this concept, students: Know the greater the mass of an object, the more force is needed to change its motion. Pushing the Envelope 2006 Science Learning Standards District of Columbia Science Grade 8 Activity/Lesson State Standards Students at this level should be honing their skills in experimental design. Students should be able to: Read analog and digital meters on instruments used to make direct measuremer	69-75)	DC	SCI.8.7.1	
at once, the effective force is the cumulative effect of all the forces. As a basis for understanding this concept, students: Know to the greater the mass of an object, the more force is needed to change its motion. Pushing the Envelope 2006 Science Learning Standards District of Columbia Science Grade 8 Activity/Lesson State Students at this level should be honing their skills in experimental design. Students should be able to: Read analog and digital meters on instruments used to make direct measurement.	, 0	DC	SCI.8.7.3	at once, the effective force is the cumulative effect of all the forces. As a basis for understanding this concept, students: Explain why an unbalanced force acting on an object changes the object's speed or direction of motion or both.
2006 Science Learning Standards District of Columbia Science Grade 8 Activity/Lesson State Standards Students at this level should be honing their skills in experimental design. Students should be able to: Read analog and digital meters on instruments used to make direct measuremental design.		DC	SCI.8.7.5	at once, the effective force is the cumulative effect of all the forces. As a basis for understanding this concept, students: Know that the greater the mass of an object, the more
2006 Science Learning Standards District of Columbia Science Grade 8 Activity/Lesson State Standards Students at this level should be honing their skills in experimental design. Students should be able to: Read analog and digital meters on instruments used to make direct measuremental design.				
Learning Standards District of Columbia Science Grade 8 Activity/Lesson State Standards Students at this level should be honing their skills in experimental design. Students should be able to: Read analog and digital meters on instruments used to make direct measuremental design.				
Grade 8 Activity/Lesson State Students at this level should be honing their skills in experimental design. Students should be able to: Read analog and digital meters on instruments used to make direct measurement				
Grade 8 Activity/Lesson State Standards Students at this level should be honing their skills in experimental design. Students should be able to: Read analog and digital meters on instruments used to make direct measurement			Learning Sta	ndards
Activity/Lesson State Standards Students at this level should be honing their skills in experimental design. Students should be able to: Read analog and digital meters on instruments used to make direct measurements.		Science		
Students at this level should be honing their skills in experimental design. Students should be able to: Read analog and digital meters on instruments used to make direct measuremen		04-4-	Otava da vala	
	-	State	Standards	skills in experimental design. Students should be able to: Read analog and digital meters on instruments used to make direct measurements of length, volume, weight, elapsed time, rates, or
Chemistry (pgs. 25- 41) DC SCI.8.2.4 temperatures, and choose appropriate units. Explain how to interpolate on analog scales. Students at this level will be refining their understandings around concepts of structure matter. Students should be able to: All objects experience a buoyant force when immersed in		DC	SCI.8.2.4	temperatures, and choose appropriate units. Explain how to interpolate on analog scales. Students at this level will be refining their understandings around concepts of structure of matter. Students should be able to: All objects experience a buoyant force when immersed in a
Chemistry (pgs. 25- students:Know that density is mass per unit	Chemistry (nas. 25			fluid. As a basis for understanding this concept,
41) DC SCI.8.3.4 volume.		DC	SCI 8 3 4	

			Students will be introduced to the Law of
			Conservation of Mass and its application to
			understanding chemical and physical changes.
			Specifically students should be able to: Explain
			how the idea of atoms explains the conservation
			of matter: In chemical reactions, the number of
			atoms stays the same no matter how they are
01			arranged, and the mass of atoms does not
Chemistry (pgs. 25-	DC	SCI.8.7.2	change significantly in chemical reactions, so
41)	DC	301.0.7.2	their total mass stays the same. Students will be introduced to the relationship
			between forces and motion. Students will also
			explore the mathematical relationships between
			forces and motion as well as the graphical
			representation of these relationships.
			Specifically students should be able to:
Physics and Math			Recognize that a force has both magnitude and
(pgs. 43-63)	DC	SCI.8.11.1	direction.
			Students will be introduced to the relationship
			between forces and motion. Students will also
			explore the mathematical relationships between
			forces and motion as well as the graphical
			representation of these relationships.
			Specifically students should be able to: Observe
			and explain that when the forces on a object are
Physics and Math			balanced (equal and opposite forces that add up to zero), the motion of the object does not
(pgs. 43-63)	DC	SCI.8.11.2	change.
(pgs. 40 00)		001.0.11.2	Students will be introduced to the relationship
			between forces and motion. Students will also
			explore the mathematical relationships between
			forces and motion as well as the graphical
			representation of these relationships.
			Specifically students should be able to: Explain
			why an unbalanced force acting on an object
Physics and Math			changes the object's speed or direction of
(pgs. 43-63)	DC	SCI.8.11.3	motion or both.
			Students will be introduced to the relationship
			between forces and motion. Students will also
			explore the mathematical relationships between forces and motion as well as the graphical
			representation of these relationships.
			Specifically students should be able to: Know
Physics and Math			that the greater the mass of an object, the more
(pgs. 43-63)	DC	SCI.8.11.4	force is needed to change its motion.
			Students will be introduced to the relationship
			between forces and motion. Students will also
			explore the mathematical relationships between
			forces and motion as well as the graphical
			representation of these relationships.
Dealest Astinite (a.			Specifically students should be able to:
Rocket Activity (pgs.	DC	CCI 0 44 4	Recognize that a force has both magnitude and
69-75)	DC	SCI.8.11.1	direction.

			Students will be introduced to the relationship between forces and motion. Students will also
			explore the mathematical relationships between
			forces and motion as well as the graphical
			representation of these relationships.
			Specifically students should be able to: Know
Rocket Activity (pgs.			that the greater the mass of an object, the more
69-75)	DC	SCI.8.11.4	force is needed to change its motion.
00 10)		001.0.11.4	lorde to freeded to sharige its motion.
		Pushing the Ei	nvelope
		2006 Scier	
		Learning Star	ndards
District of Columbia			
Grades 9-12 (Physic	<u> </u>		
Activity/Lesson	State	Standards	
			Nowton's laws of motion and gravitation
			Newton's laws of motion and gravitation describe and predict the motion of a vast variety
			of objects. As a basis for understanding this
			concept, students: Create and interpret graphs
Types of Engines (of speed versus time and the position and speed
pgs. 11-23)	DC	SCI.P.2.13	of an object undergoing constant acceleration.
<u>pge: :: =e/</u>			or an object and organization and object and organization
			Newton's laws of motion and gravitation
			describe and predict the motion of a vast variety
			of objects. As a basis for understanding this
			concept, students: Explain that when the net
			force on an object is zero, no acceleration
			occurs; thus, a moving object continues to move
	1		
Physics and Math			at a constant speed in the same direction, or, if
	DC	SCI.P.2.1	at rest, it remains at rest (Newton's first law).
Physics and Math (pgs. 43-63)	DC	SCI.P.2.1	at rest, it remains at rest (Newton's first law). Newton's laws of motion and gravitation
	DC	SCI.P.2.1	at rest, it remains at rest (Newton's first law). Newton's laws of motion and gravitation describe and predict the motion of a vast variety
	DC	SCI.P.2.1	at rest, it remains at rest (Newton's first law). Newton's laws of motion and gravitation describe and predict the motion of a vast variety of objects. As a basis for understanding this
	DC	SCI.P.2.1	at rest, it remains at rest (Newton's first law). Newton's laws of motion and gravitation describe and predict the motion of a vast variety of objects. As a basis for understanding this concept, students: Explain that only when a net
(pgs. 43-63)	DC	SCI.P.2.1	at rest, it remains at rest (Newton's first law). Newton's laws of motion and gravitation describe and predict the motion of a vast variety of objects. As a basis for understanding this concept, students: Explain that only when a net force is applied to an object will its motion
(pgs. 43-63) Physics and Math			at rest, it remains at rest (Newton's first law). Newton's laws of motion and gravitation describe and predict the motion of a vast variety of objects. As a basis for understanding this concept, students: Explain that only when a net force is applied to an object will its motion change; that is, it will accelerate according to
(pgs. 43-63) Physics and Math	DC DC	SCI.P.2.1	at rest, it remains at rest (Newton's first law). Newton's laws of motion and gravitation describe and predict the motion of a vast variety of objects. As a basis for understanding this concept, students: Explain that only when a net force is applied to an object will its motion change; that is, it will accelerate according to Newton's second law, F = ma.
(pgs. 43-63) Physics and Math			at rest, it remains at rest (Newton's first law). Newton's laws of motion and gravitation describe and predict the motion of a vast variety of objects. As a basis for understanding this concept, students: Explain that only when a net force is applied to an object will its motion change; that is, it will accelerate according to Newton's second law, F = ma. Newton's laws of motion and gravitation
(pgs. 43-63) Physics and Math			at rest, it remains at rest (Newton's first law). Newton's laws of motion and gravitation describe and predict the motion of a vast variety of objects. As a basis for understanding this concept, students: Explain that only when a net force is applied to an object will its motion change; that is, it will accelerate according to Newton's second law, F = ma. Newton's laws of motion and gravitation describe and predict the motion of a vast variety
(pgs. 43-63) Physics and Math			at rest, it remains at rest (Newton's first law). Newton's laws of motion and gravitation describe and predict the motion of a vast variety of objects. As a basis for understanding this concept, students: Explain that only when a net force is applied to an object will its motion change; that is, it will accelerate according to Newton's second law, F = ma. Newton's laws of motion and gravitation describe and predict the motion of a vast variety of objects. As a basis for understanding this
(pgs. 43-63) Physics and Math			at rest, it remains at rest (Newton's first law). Newton's laws of motion and gravitation describe and predict the motion of a vast variety of objects. As a basis for understanding this concept, students: Explain that only when a net force is applied to an object will its motion change; that is, it will accelerate according to Newton's second law, F = ma. Newton's laws of motion and gravitation describe and predict the motion of a vast variety of objects. As a basis for understanding this concept, students: Predict and explain how
(pgs. 43-63) Physics and Math			at rest, it remains at rest (Newton's first law). Newton's laws of motion and gravitation describe and predict the motion of a vast variety of objects. As a basis for understanding this concept, students: Explain that only when a net force is applied to an object will its motion change; that is, it will accelerate according to Newton's second law, F = ma. Newton's laws of motion and gravitation describe and predict the motion of a vast variety of objects. As a basis for understanding this concept, students: Predict and explain how when one object exerts a force on a second
(pgs. 43-63)			at rest, it remains at rest (Newton's first law). Newton's laws of motion and gravitation describe and predict the motion of a vast variety of objects. As a basis for understanding this concept, students: Explain that only when a net force is applied to an object will its motion change; that is, it will accelerate according to Newton's second law, F = ma. Newton's laws of motion and gravitation describe and predict the motion of a vast variety of objects. As a basis for understanding this concept, students: Predict and explain how when one object exerts a force on a second object, the second object always exerts a force
(pgs. 43-63) Physics and Math			at rest, it remains at rest (Newton's first law). Newton's laws of motion and gravitation describe and predict the motion of a vast variety of objects. As a basis for understanding this concept, students: Explain that only when a net force is applied to an object will its motion change; that is, it will accelerate according to Newton's second law, F = ma. Newton's laws of motion and gravitation describe and predict the motion of a vast variety of objects. As a basis for understanding this concept, students: Predict and explain how when one object exerts a force on a second

			Newton's laws of motion and gravitation describe and predict the motion of a vast variety of objects. As a basis for understanding this concept, students: Explain that Newton's laws of motion are not universally applicable, but they provide very good approximations, unless an object is moving close to the speed of light, has
Physics and Math (pgs. 43-63)	DC	SCI.P.2.4	a very large mass, or is small enough that quantum effects are important.
Physics and Math (pgs. 43-63)	DC	SCI.P.3.1	Recognize that when a net force, F, acts through a distance, delta x, on an object of mass, m, which is initially at rest, work, W = F delta x, is done on the object; the object acquires a velocity, v, and a kinetic energy, K = ½ mv2 = W = F delta x.
Physics and Math (pgs. 43-63)	DC	SCI.P.3.2	Describe how an unbalanced force, F, acting on an object over time, delta t, results in a change, delta p = F delta t, in the object's momentum.
Rocket Activity (pgs. 69-75)	DC	SCI.P.2.2	Newton's laws of motion and gravitation describe and predict the motion of a vast variety of objects. As a basis for understanding this concept, students: Explain that only when a net force is applied to an object will its motion change; that is, it will accelerate according to Newton's second law, F = ma.
Rocket Activity (pgs. 69-75)	DC	SCI.P.2.3	Newton's laws of motion and gravitation describe and predict the motion of a vast variety of objects. As a basis for understanding this concept, students: Predict and explain how when one object exerts a force on a second object, the second object always exerts a force of equal magnitude but of opposite direction and force back on the first: F1 on 2 = -F2 on 1 (Newton's third law).
Rocket Activity (pgs. 69-75)	DC	SCI.P.3.1	The laws of conservation of energy and momentum provide independent approaches to predicting and describing the motion of objects. As a basis for understanding this concept, students: Recognize that when a net force, F, acts through a distance, delta x, on an object of mass, m, which is initially at rest, work, W = F delta x, is done on the object; the object acquires a velocity, v, and a kinetic energy, K = ½ mv2 = W = F delta x.